



U.S. Department  
of Transportation

Pipeline and  
Hazardous Materials  
Safety Administration

COMPETENT AUTHORITY CERTIFICATION  
FOR A TYPE B(U)F FISSILE  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/0401/B(U)F-96, REVISION 11

East Building, PHH-23  
1200 New Jersey Avenue SE  
Washington, D.C. 20590

REVALIDATION OF JAPANESE COMPETENT AUTHORITY  
CERTIFICATE J/111/B(U)F-96

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - JMS-87Y-18.5T.
2. Package Description and Authorized Radioactive Contents - as described in Japan Certificate of Competent Authority J/111/B(U)F-96, Revision 1 (attached).
3. Criticality - The minimum criticality safety index is 0.0. The maximum number of packages per conveyance is determined in accordance with Table X of the IAEA regulations cited in this certificate.
4. General Conditions -
  - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
  - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
  - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

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<sup>1</sup> "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

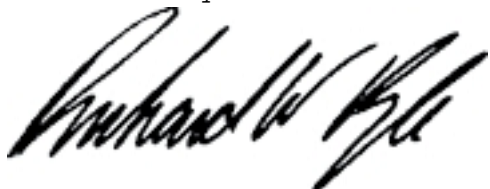
**CERTIFICATE USA/0401/B(U)F-96, REVISION 11**

- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations<sup>1</sup> shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.
5. Special Conditions -
- a. In accordance with the attached Japanese Certificate of Competent Authority, the package is not to be transported by air.
  - b. Maximum decay heat per package is 1.5 kilowatts.
  - c. Known or suspected failed fuel assemblies and fuel with cladding defects greater than pin holes and hairline cracks are not authorized.
  - d. Neutron poison plates in the fuel basket must be constructed in accordance with JAERI document entitled "JMS-87Y-18.5T Package Information" dated June 11, 2003.
  - e. For shipments which enter into or transit the United States, all international approvals and revalidations, including Approval of Packaging and Confirmation of Packaging certificates issued by the government of Japan, shall be issued prior to the commencement of transport.
6. Marking and Labeling - The package shall bear the marking USA/0401/B(U)F-96 in addition to other required markings and labeling.
7. Expiration Date - This certificate expires on October 12, 2009.

**CERTIFICATE USA/0401/B(U)F-96, REVISION 11**


This certificate is issued in accordance with paragraph 814 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the February 12, 2007 petition by Edlow International Company, Washington, DC, and in consideration of other information on file in this Office.

Certified By:



**Jul 31 2007**

(DATE)

 Robert A. Richard

Deputy Associate Administrator for Hazardous Materials Safety

Revision 11 - issued to endorse Japanese Certificate of Competent Authority  
No. J/111/B(U)F-96 (Rev.1) dated October 31, 2006.

**COMPETENT AUTHORITY  
OF  
JAPAN**

**CERTIFICATE OF APPROVAL OF PACKAGE DESIGN  
FOR THE TRANSPORT OF RADIOACTIVE MATERIALS**

**ISSUED BY MINISTRY OF EDUCATION, CULTURE,  
SPORTS, SCIENCE AND TECHNOLOGY**

**2-5-1 MARUNOUCHI, CHIYODA-KU, TOKYO, JAPAN**

CERTIFICATE OF APPROVAL OF PACKAGE DESIGN  
FOR THE TRANSPORT OF RADIOACTIVE MATERIALS

This is to certify, in response to the application by Japan Atomic Energy Agency on October 10, 2006, that the Design of Package described herein satisfies the design requirements of Type B(U)F specified in "Regulations for the Safe Transport of Radioactive Material (International Atomic Energy Agency, Safety Standards Series No. TS-R-1 1996 Edition (As Amended 2003))" and the Japanese rules based on the Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

COMPETENT AUTHORITY

IDENTIFICATION MARK: J/111/B (U) F-96(Rev.1)

October 31, 2006  
Date for

Kaoru Kohara  
Kimihiro Oda

Director General,  
Science and Technology Policy Bureau,  
Ministry of Education, Culture,  
Sports, Science and Technology.  
Competent Authority of Japan for  
Package Designs of Radioactive Materials

**1. NAME OF PACKAGE**

: JMS-87Y-18.5T

(IDENTIFICATION MARK: J/111/B (U) F-96 Rev.1)

**2. SPECIFICATION OF CONTENTS****(1) Description of Contents**

1) Materials of Nuclear Fuel : See Table 1

**(2) Qualitative Restrictions on Contents**

1) Initial Gross Weight of Uranium-235 : See Table 1

2) Initial Gross Weight of Uranium : See Table 1

3) Total Activity of Contents : See Table 1

4) Uranium-235 Initial Enrichment : See Table 1

5) Burnup : See Table 1

6) Total Heat Generation Rate : See Table 1

7) Cooling Time : See Table 1

8) Number of Spent Fuel Elements : See Table 1

**3. SPECIFICATION OF PACKAGE**

(1) Total Weight of Package : 18440 kg or less

**(2) Outside Dimension of Packaging**

1) Outer Diameter : Approx. 1.9 m

2) Height : Approx. 2.0 m

**(3) Materials of Packaging**

1) Cask Body and Lid : Stainless Steel

2) Basket : Stainless Steel, Boral Plate

3) Shock Absorber : Stainless Steel, Fir-plywood

(4) Package Illustration : See Figure 1

**4. RESTRICTIONS ON TRANSPORT**

1) Array : No restriction

2) Restriction Number : No restriction

3) Criticality safety index : 0

#### 5. SPECIAL FEATURES ASSUMED IN THE CRITICALITY ASSESSMENT

Any special features are not considered in the criticality assessment, because the subcriticality calculation is evaluated upon the assumption that internal void space of the packaging are filled with water.

#### 6. DETERMINATION IN THE CRITICALITY ASSESSMENT

Any determination is not considered in the criticality assessment, because the subcriticality calculation is evaluated upon the condition of the fresh nuclear fuels.

#### 7. RESTRICTIONS ON THE MODES OF TRANSPORT

It is not confirmed that the design of package satisfies the additional requirements for packages transported by air.

#### 8. INSTRUCTIONS ON USE AND MAINTENANCE OF PACKAGING

The packaging shall be handled with care according to the operating manual. In order to ensure the integrity of packaging the following inspection shall be performed at least once a year (in case frequency of transport exceeds 10 times a year, the inspections shall be done at least once per every 10 times.).

- (1) Visual Inspection
- (2) Pressure Durability Inspection
- (3) Leakage Rate Measurement Inspection
- (4) Maintenance of O-ring, Valve, etc. Used for Containment System
- (5) Shielding Inspection
- (6) Subcriticality Inspection
- (7) Heat Transfer Inspection
- (8) Lifting Inspection

#### 9. ACTION PRIOR TO SHIPMENT

Each package shall be inspected for the following items prior to each shipment.

- (1) Visual Appearance Inspection
- (2) Lifting Inspection
- (3) Weight Measurement Inspection
- (4) Surface Contamination Measurement Inspection
- (5) Radiation Dose Rate Measurement Inspection
- (6) Subcriticality Inspection
- (7) Contents Inspection
- (8) Surface Temperature Measurement Inspection

(9) Leakage Rate Measurement Inspection

(10) Package internal Pressure Measurement Inspection

**10. PRECAUTIONS FOR LOADING OF PACKAGES FOR TRANSPORT**

Loading of the packages shall be performed such that the package will not move, roll down or fall down during transport.

**11. EXPIRY DATE**

October 12, 2009

**12. NOTE**

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

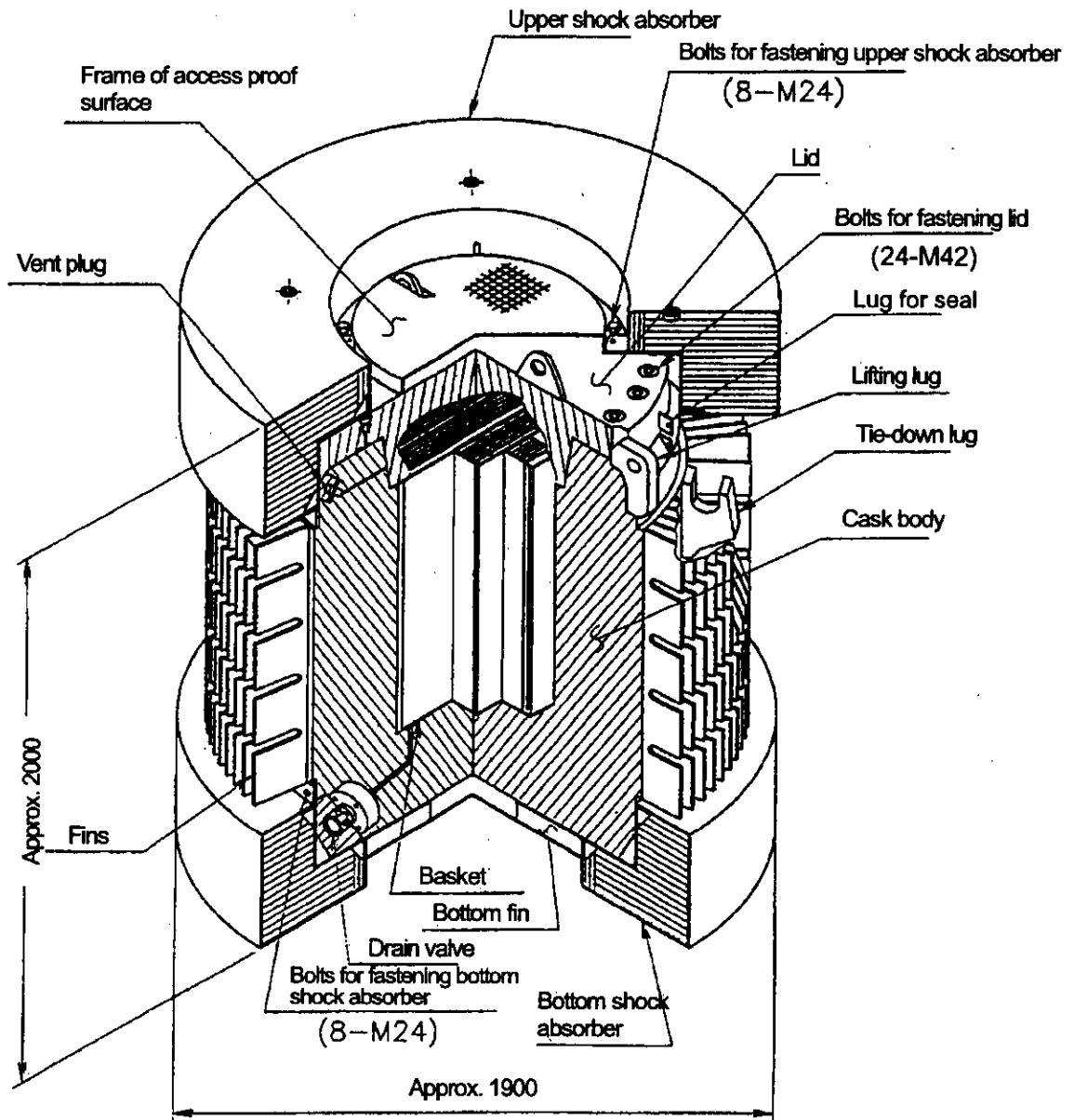


Figure 1 Illustration of JMS-87Y-18.5T Package (Unit: mm)

Table 1 Specification of Contents (1/2)

Type	Reactor	JMTR		JMTR		JMTR	
		High Enriched Uranium Fuels (HEU)		Medium Enriched Uranium Fuels (MEU)		Low Enriched Uranium Fuels (LEU)	
	Spent Fuel Elements	JMTR Standard Fuel Elements (HEU)	JMTR Fuel Followers (HEU)	JMTR Standard Fuel Elements (MEU)	JMTR Fuel Followers (MEU)	JMTR Standard Fuel Elements (LEU)	JMTR Fuel Followers (LEU)
Number of Spent Fuel Elements (element/package)		less than or equal to 30		less than or equal to 30		less than or equal to 30	
	<sup>235</sup> U Initial Enrichment (wt%)	less than or equal to 93.3		less than or equal to 46.0		less than or equal to 19.95	
Initial Gross Weight of <sup>235</sup> U (g/element)		less than or equal to284.3	less than or equal to 198.4	less than or equal to315.6	less than or equal to208.7	less than or equal to450	less than or equal to302
Initial Gross Weight of U (g/element)		less than or equal to 307	less than or equal to214	less than or equal to 719	less than or equal to 475	less than or equal to2338	less than or equal to1569
Material	Fuel Core	Uranium- Aluminum Alloy		Uranium-Aluminum Dispersion Alloy		Uranium-Silicon-Aluminum Dispersion Alloy	
	Cladding	Aluminum Alloy		Aluminum Alloy		Aluminum Alloy	
	Side Plate	Aluminum Alloy		Aluminum Alloy		Aluminum Alloy	
Burn-up (%)		less than or equal to 40		less than or equal to 40		less than or equal to50	less than or equal to60
Cooling Time (days)		more than or equal to 360		more than or equal to 360		more than or equal to 420	more than or equal to 540
Total Activity of Contents (TBq/30 elements)		1.65×10 <sup>4</sup>	1.16×10 <sup>4</sup>	1.78×10 <sup>4</sup>	1.18×10 <sup>4</sup>	2.43×10 <sup>4</sup>	1.43×10 <sup>4</sup>
Total Heat Generation Rate (kW/30 elements)		1.83	1.29	1.98	1.32	2.80	1.88
						2.40	1.61

Table 1 Specification of Contents (2/2)

Type	Reactor	JRR-3		JMTR					
	Spent Fuel Elements	Low Enriched Uranium Fuels (LEU)		Mixed-loading of MEU and LEU *					
		JRR-3 Standard -type Fuel Elements (LEU)	JRR-3 Follower -type Fuel Elements (LEU)	JMTR Standard Fuel Elements (MEU)	JMTR Fuel Followers (MEU)	JMTR Standard Fuel Elements (LEU)		JMTR Fuel Followers (LEU)	
Number of Spent Fuel Elements (element/package)		less than or equal to 30		less than or equal to 30					
<sup>235</sup> U Initial Enrichment (wt%)		less than or equal to 19.95		less than or equal to 46.0		less than or equal to 19.95			
Initial Gross Weight of <sup>235</sup> U (g/element)		less than or equal to 315	less than or equal to 205	less than or equal to 315.6	less than or equal to 208.7	less than or equal to 450		less than or equal to 302	
Initial Gross Weight of U (g/element)		less than or equal to 1612	less than or equal to 1049	less than or equal to 719	less than or equal to 475	less than or equal to 2338		less than or equal to 1569	
Material	Fuel Core	Uranium- Aluminum Dispersion Alloy		Uranium-Aluminum Dispersion Alloy		Uranium-Silicon-Aluminum Dispersion Alloy			
	Cladding	Aluminum Alloy		Aluminum Alloy		Aluminum Alloy			
	Side Plate	Aluminum Alloy		Aluminum Alloy		Aluminum Alloy			
Burn-up (%)		less than or equal to 50		less than or equal to 40		less than or equal to 50	less than or equal to 60	less than or equal to 50	less than or equal to 60
Cooling Time (days)		more than or equal to 360		more than or equal to 360		more than or equal to 420	more than or equal to 540	more than or equal to 420	more than or equal to 540
Total Activity of Contents (TBq/30 elements)		1.76×10 <sup>4</sup>	1.11×10 <sup>4</sup>	1.78×10 <sup>4</sup>	1.18×10 <sup>4</sup>	2.43×10 <sup>4</sup>	2.12×10 <sup>4</sup>	1.63×10 <sup>4</sup>	1.43×10 <sup>4</sup>
Total Heat Generation Rate (kW/30 elements)		1.94	1.23	1.98	1.32	2.80	2.40	1.88	1.61

\* Among the cases of loading all kinds of uranium fuels, containing 30 JMTR standard fuel elements (LEU) is considered the most limiting case. in terms of critical analysis. Therefore, mixed loading of medium enriched uranium fuels (MEU) and low enriched uranium fuels (LEU) does not exceed the requirements for 30 JMTR fuel elements (LEU).



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Washington, D.C. 20590

**CERTIFICATE NUMBER:** USA/0401/B(U)F-96, Revision 11

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